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ABSTRACT

The problems and prospects faced by involving the nonprint informational units in interlibrary communication and information networks are described. Nonprint materials are defined as those materials not totally dependent on the printed word for meaning. Nonprint materials were further identified as storage devices for information or experiences--these devices can be handled in information centers, or libraries, in a manner like all other informational units. Following the definition of nonprint materials is a discussion of the concept of a library or information resource center. The types of libraries holding nonprint materials are listed and ways or reasons for their further sharing of materials discussed. Specific potential problems faced in the path leading to full use of nonprint resources are presented with potential solutions. The major portion of the paper discusses the technical aspects of nonprint materials retrieval and display as well as remote transmission of information. The paper is closed by a brief review of current significant developments in the media field that are destined to have an impact on library science or the use of information. (Other papers from this conference are available as LI 003360 - 003366 and LI 003668 through LI 003390) (Author/NH)

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the path to interlibrary networking for audio visual materials

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ABSTRACT

Explored is the construct that the contents of what we identify as libraries are information rather than collections of books, films, recordings, or other physical devices for information storage. The merging of nonprint, or audiovisual resources, into the print materials collection so as to provide the patron using the library access to a wide-base informational store. The problems and prospects faced by involving the nonprint informational units in interlibrary communication and information networks are described.

Nonprint materials are defined as those materials not totally dependent on the printed word for meaning. Nonprint materials were further identified as storage devices for information or experiences--these devices can be handled in information centers, or libraries, in a manner like all other informational units. Following the definition of nonprint materials is a discussion of the concept of a library or information resource center. The types of libraries holding nonprint materials are listed and ways or reasons for their further sharing of materials discussed.

Specific potential problems faced in the path leading to full use of nonprint resources are presented with potential solutions. The first problem is bibliographic control. It is pointed out that print bibliographic control techniques are

applicable to the information stored in the nonprint devices. Personnel, another major problem to be overcome for the insurance of full media use, and aspects of the change process are presented as not only a problem but the hope for full patron service. The role of the translator-librarian is explored. Administrative operations and the political or legal problems involved in development of full media use programs are briefly mentioned.

The major portion of the paper discusses the technical aspects of nonprint materials retrieval and display as well as remote transmission of information. Specific mention is made of current technological developments in both nonprint materials storage and transmission. The paper is closed by a brief review of current significant developments in the media field that are destined to have an impact on library science or the use of information. Offered is an optimistic view of what is being developed, what will be developed, and the way we access and use the knowledge of man as represented by informational stores found in libraries of knowledge resource centers.

I. PRINT AND NONPRINT MATERIALS AND LIBRARY DEFINED

Before we can explore the relationships of interlibrary communication and information networking as related to nonprint informational units, we must accept the assumption that libraries can no longer consume quantities of energy making distinctions between the kinds of materials acquisitioned as information storage units--as far as storage units, books are comparable to films, films to recordings on tape, tape to periodicals.[1] We are considering information. The output of man's activities may be information or knowledge. Knowledge resource centers might be a name for libraries.[2] These knowledge resource centers (KRC), in schools at least, says Clair Eatough, will go a long way towards alleviating today's massive problems of materials logistics--the KRC will provide the patron with needed information in a manner relevant to the patron's need and intended use. The KRC will be a pumphouse for information.[3]

Nonprint materials may generally be defined as those materials not totally dependent on printed words to transmit

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[1]Sister M. Claudia Carlen, "Expanding Resources: The Explosion of the Sixties," Library Trends, 18 (July, 1969), 49.

[2]Clair L. Eatough, "What Tomorrow's Library Will Look Like," Nation's Schools, 77 (March, 1966), 109.

[3]Ibid.

meaning. These materials are storage devices for information or experiences. These nonprint storage units may take the form of motion pictures on film or magnetic storage devices, audio information on magnetic devices or pressed into vinyl discs, computer generated graphics or even speech, but in each case the items are not dependent on printed words for the user to extract meaning from the information or experience. As informational storage devices the nonprint media are the same as any other print item, just the medium of storage is different. One thing all nonprint media have in common is that they require some sort of display device (projector, playback, viewer, etc.) before information may be accessed. Not all print media are free of the display device need, however.

When functionally defining a library it is in keeping with the information center concept to indicate that it is a collection of informational units organized in a manner allowing for retrieval of the stored information. The library is further organized to function in the process of information transfer between the storage medium and the patron and the library may become involved in the ultimate use of the information by the patron (this implies much more than just providing information). The content of the library is usually in printed or book form and reading remains the principle means of information transfer. Many other storage devices beyond the print are used, however, in this information transfer function.[4] C. Walter Stone stresses

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[4]T. N. Dupuy, Ferment in College Libraries: The Impact of Information Technology (Washington, D.C.: Communication Service Corporation, 1968), pp. 3-4.

the fact that we are experiencing a shift from a material oriented library operation to an idea-information oriented operation.[5] Stone also indicates, with our new orientation on information contained in things and not the storage things, the library function has become so important that it should not be entrusted solely to librarians or any other single communication group.[6] The information or knowledge resource center (which we shall continue to call a library) will be staffed by catalogers, bibliographers, mediagraphers, administrators, communications specialists, information translators, and audiovisual or media specialists. These librarians will design and operate the functioning components of the library system which are:

1. Storage systems for the informational units.

2. Retrieval systems to bring the items from storage.

3. "Bibliographic" systems to inform the seeker of information what he may access to solve his informational need (usually provides indications on how to access the units as well).

4. Display of the informational storage units. This display may be from local or remote informational stores.

5. Creation of new informational storage units. Libraries are involved in storage of ideas or knowledge. As new ideas are created libraries may be called upon to create the storage unit and to assist in the communication of these ideas.

In Libraries of the Future Licklider described types of libraries--he identified the "procognitive" system, the library

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[5] C. Walter Stone, "The Library Function Redefined," Library Trends, 16 (October, 1967), 183.

[6] Ibid., p. 181.

system we are viewing, as one operating to promote and facilitate the acquisition, organization, and use of knowledge.[7]

Generalizing from the preceding discussion of libraries as organizations which store and provide informational units we can list the main types of libraries in which nonprint materials are found.

1. Rental libraries--these may be commercial or noncommercial. Generally 16mm motion pictures are the rented items. Commercial libraries may circulate the Hollywood variety of entertainment film or the information film. The patron may be charged the rental or, in the case with sponsored commerical films, the depositing-sponsoring agency pays the library for each circulation. Noncommercial are generally found at colleges and their materials are circulated mainly to other educational agencies.

2. Academic libraries--frequently a mixed media collection of informational resources is provided through the library. In many cases the audiovisual center is a separate entity within the library with all nonprint materials listed in the master bibliographic file and the institution's patrons can access the stored materials. In a few libraries the audiovisual materials, personnel, and administration are merged into the total resource center program.

3. Academic nonprint library cooperatives--a banding together of higher education institutions into a program to provide on a cooperative basis a collection of informational units. These arrangements may be as simple as informal borrowing (since little interlibrary loaning of nonprint materials takes place) or elaborate financial arrangements with pooled monies to develop a collection and provide personnel to operate the nonprint system.

4. Common schools--a large variety of nonprint resources are used in grades 1-12 and many school districts have centralized audiovisual collections which may be supplemented by materials from commercial or noncommercial libraries.

5. School cooperatives--operates as the equal to the academic nonprint library cooperative.

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[7]J. C. R. Licklider, Libraries of the Future (Cambridge, Mass.: MIT Press, 1965), p. 21.

6. Public libraries--generally the most prominent nonprint resource is recordings of music or dramatic works. Many larger libraries have film and slide collections and some even provide the patron with equipment he may check out to display the materials. Cooperative programs also have developed to provide access for libraries to shared collections of films or other materials, nonprint in nature. Public libraries are a most likely contact point with a patron requesting information and they should be a provider of data on what nonprint resources exist elsewhere and how they can be accessed.

7. Industrial and special libraries--these collections are usually limited to the specific needs of the supporting agency and most likely the material is available for in-plant use or as promotional material.

8. Government agencies--often, on either the state or federal level, the individual agencies try to distribute to the public by themselves nonprint materials. In increasing numbers centralized distribution services are being developed between agencies. These agencies are often sources for considerable recorded history of operations significant to that agency.

9. Museums, galleries, historical societies--nearly the total collections can be classified as nonprint (even old books when considered as a historical object and not the container of information). This is an amorphous combination of things, all valuable and usable.

10. Private or personal collections--often of value but most difficult to identify and organize as usable information stores accessable by patrons.

"The record of knowledge is now too extensive to be accommodated in a single library in a single form."[8] What we have described are varieties of libraries which store and provide on demand informational units of a nonprint nature. Identification of potential problems in the exchange of information in nonprint units can be factored into five topics: (1) "bibliographic" control, (2) personnel, (3) administrative, (4) technical, and

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[8]Carlen, "Expanding Resources: The Explosion of the Sixties," p. 53.

(5) legal (political). The following sections will explore these five problem areas--let it suffice to indicate now that these problems should be solvable, if our priorities are high enough. Man has solved some fairly complicated problems.

II. POTENTIAL PROBLEMS--POTENTIAL SOLUTIONS

The promise of total information access is a most difficult construct for us to grasp. We have an awareness of many conveniences that will be afforded us and our patrons as we operate in information centers and as patrons negotiate for or request information from our stores--we can see operational assistance in cataloging, interlibrary loan, reference, information display, but, without a doubt, we can see potential problems. Following will be a discussion of potential problem areas with respect to nonprint informational units and some of what this author feels are potential solutions. If these problems facing the nonprint realm sound similar to those facing print, that is understandable when the informational unit (not specific storage medium) question is analyzed. Interlibrary communication and information networking will be concerned with stored information.

"Bibliographic" control, the essential element of organization of all library collections, is highly developed and applied in the print realm. Nonprint libraries (incorrectly called libraries in many cases) are often staffed by nonlibrarian personnel interested in the circulation of a collection, limited in size, to an identifiable patron group. There are almost as many "bibliographic" control systems for nonprint collections as there are collections.

"Bibliographic" control, when we analyze the word bibliographic, is not applicable to nonbook resources. As the term is used for other than books it is the reference to the construct of information cataloging or control that is being made. "Bibliographic" control, as it is used here, refers to the processing of information about the information contained in the multitude of storage devices stored ready for access in the library.

For the past few decades we have heard reasons, too numerous to list here, why, supposedly, nonprint items could not be cataloged, classified, retrieved, provided to the patron, etc., like print informational units. Since libraries are a procognitive system designed to promote and facilitate the acquisition, organization, and use of knowledge, in each of these functions we are limited by the constraint that when information flows in or out of the library it must pass through people or their systems.[1] In the print world there is agreement, generally, on how the bibliographic file representing the content of the collection is to be organized. In the nonprint world this is not quite so.

There are manuals (many manuals--all telling a different story) on how to organize and control nonprint collections. These "re-inventions" of the wheel (or attempts to improve on the existing wheel) often are an individualized system that works at one place. Each manual has devotees. Each manual has good points. But they differ from each other in how they call for organizing

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[1]Licklider, pp. 21 and 28.

the information on the library catalog card, or they disagree on the color of the card to represent different physical storage units (blue for slides--some are pink--and green for motion pictures) and some do not use color coding but use number coding, or use no coding. A few manuals base their systems on what is accepted for print. But many nonprint resource specialists, generally not trained librarians, reject the "print approach"--likewise many print librarians reinforce the nonprint person by agreeing that a phonodisc is so different from the printed score of an opera that they can not be listed in the same "bibliographic" file.

Until there is developed a cataloging and/or bibliographic control system for nonprint informational units that provides the sophistication to meet the indexing, storage, and retrieval needs of information, we have problems. Likewise, as long as the content of print items is treated differently than nonprint, the patron will have difficulty in identifying the total informational store available to him. A common bibliographic control system presenting information to the patron on the available information (in a wide variety of storage devices, possibly) in a library or system of libraries (or information stores) is an essential ingredient in interlibrary communication and information networking.

The Systems and Standards for the Bibliographic Control of Nonprint Media Institute, funded by the United States Office of Education, brought together library and audiovisual specialists from Canada, Great Britain, and the United States to study and educate themselves about this problem. This group found it

difficult to accept the fact that the bibliographic control systems for nonprint materials exists--it has been used for years with print materials and nonprint librarians need to learn to apply it. Retraining of people to use the existing tools and to improve on them is the task that must be tackled.

Professional resistance, found whenever change is being considered, must be analyzed as we develop comprehensive mixed media information stores. In making reference to "book" we will need to learn to think of the generic idea of book with the word book representing the concept of informational storage device.[2] In all forms of library operation, except the act of display and physical storage, nonprint materials can be handled as physical objects to be warehoused (allowing for retrieval) and cataloged with retrieval addresses.[3] Ponder for a moment the Library of Congress with the 60 million items (books, serials, maps, photographs, recordings, films, and the like) and the world's largest file which contains 16.5 million records. There are 1,260 different files in use at the Library of Congress.[4] Can a mixed media collection of such magnitude exist? Can the bibliographic data on the informational content of the holdings be merged into a single file?

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[2]Sister Helen Sheehan, "The Library-College Idea: Trend of the Future," Library Trends, 18 (July, 1968), 93.

[3]Robert S. Taylor, "Technology and Libraries," Educom, 4 (May, 1970), 5.

[4]Paul R. Reimers and Henriette D. Avram, "Automation and the Library of Congress: 1970," Datamation, 16 (June, 1970), 138.

Within the American Library Association there has been much interest in the bibliographic control of nonprint materials. The Department of Audiovisual Instruction (now the Association for Educational Communication and Technology) is extending its activities in the area of applying the principles of library-information science to nonprint resources and information. At the 1970 DAVI convention approval was granted to a group of nonprint librarians to form the Media Organization and Control Division. The activities of this division will be in the standardization of bibliographic control systems and the application of library science principles to nonprint resources.

Historically, with the possible exception of the Committees on Cataloging Audiovisual Material and on Information Science, members of Association for Educational Communication and Technology (AECT) have tended to look on bibliographic organizational processes for nonprint media resources as logistic or high class clerical tasks. Because of this, professionals concerned with the library and information science skills necessary for the bibliographic organization and control of nonprint media have, by default, turned to professional organizations other than AECT. As recently as June 29, the Executive Committee of the American Library Association's Cataloging and Classification Section, RTSD, unanimously passed a resolution recommending that the "Canadian Library Association publication, Non-Book Materials (preliminary edition), be accepted as an interim guide for the cataloging of nonbook materials, with the proviso that a permanent ALA-CLA committee be established to work on any necessary revision for the

final edition and its supplements." Nowhere does the motion even acknowledge the existence of the Association for Educational Communications and Technology by either its present or former name. Space on the program has already been reserved at the October 11-15 annual meeting of the American Society for Information Science in Philadelphia by those interested in forming an ASIS Special Interest Group to deal with problems of nonprint media and the application of information science techniques and technology to its organization and control.

The AECT must become involved with the problems of bibliographic control, as well as the hardware and techniques of educational communications. It is in a position to exert some influence over the numerous, uncoordinated efforts by various services, journals, and other professional organizations to provide information about the availability and utility of nonprint media. It can provide research and statistics concerning the software of educational communications and work with producers and indexers toward standardization of modes of access and user retrieval formats for such materials. It can provide the basis for informed legislation at the local and national levels such as that affecting the Library of Congress's ability to process nonprint materials and to incorporate them into their MARC (MAchine Readable Cataloging) output. It should work toward a national bibliographic service or system for nonprint media, with a sharp eye toward international implications, which will be able to inform any educator at any time of what is available, to whom, under what peculiar circumstances, and with what results for a specific patron.

Hesitancy to provide full access to nonprint materials available is often justified because, it is rationalized, the nonprint items are more easily damaged than print items and they are costly, and most nonprint items require display devices that may not be readily available. Without a doubt the book is the simplest to use (mechanically) information storage device we have and it is often the least expensive for amount of information that can be stored. This does not justify excluding from use the more costly items. Today we provide patrons access to expensive print items without much formality--but we might require a deposit or we retain a library card when a patron checks out a sound filmstrip set (the book might cost $20 and the sound filmstrip $30).

With familiarity through increased use we will provide access to nonprint materials plus the needed display equipment. Continued technological developments will make the display equipment simpler to operate and more "goof-proof," thus helping prevent damage to the informational unit. Personnel in libraries need to be made aware that these nonprint items are nothing more than information storage devices. The audiovisual specialists need to quit implying how complex, expensive, and difficult to use the nonprint materials are and the print librarians need to expand their horizons beyond their traditional realm of operation.

Awareness of the holdings in remote collections is as much a problem, if not more, in the realm of nonprint materials as in print. With so many print/nonprint collections existing without a merged holdings information file the requester of information

about a specific subject may receive information only about what is found in a certain storage medium. Union lists of nonprint holdings are a rarity today but they are being developed as demands for nonprint material increase. In Washington State, for example, one of the groups operating under the State Library as plans for the Washington State Library Network are studied is examining the total nonprint holdings within the State. This group has identified clusters of nonprint materials and grouped these clusters of nonprint stores into a subject arrangement. A task yet to be tackled is the identification of specific items by title and content so that a complete subject based union listing can be developed. These tasks will be furthered on the way to success when a standardized bibliographic information system is operative, simplifying the origination of bibliographic data and the sharing of this data.

It is interesting that libraries have developed information locating tools in fields where the frequency of demand justifies the production of these tools. Indicies, abstracts, data sheets, etc., exist in areas where society has recognized the urgency of need for information.[5] We are seeing the development of these tools for nonprint resources--the National Information Center for Educational Media listings of 16mm motion pictures, filmstrips, overhead transparencies, and the review services such as Book Review Digest or Landers Film Reviews, just to name a few. As

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[5]Ralph R. Shaw, "Using Advances in Technology to Make Library Resources More Available," in Student Use of Libraries (Chicago: American Library Association, 1964), p. 73.

needs increase they become evident--as they become evident they become demands and are often met.

Sources for bibliographic data usable in cataloging and related tasks are increasing. The MARC format now allows for handling certain nonprint items. In time the MARC distribution system can become a source for bibliographic information on the total of all informational units generated and the MARC records for nonprint accessed and used like the records for print. Copyright procedures offer one means for refining the responsibilities of the creator of an informational unit in providing bibliographic data. It has been discussed by librarians and information specialists that funding for a research project to develop a model of a bibliographic control system for nonprint materials compatible with the existing print systems be sought. The results of this project would be to report to the information field what actually is being done, how it works, how it fits existing systems, and then to offer a heuristic model for bibliographic control of nonprint materials. The system, and model, would be a series of components with each component operating as a usable subsystem that could be part of other systems.

One of the powerful elements that must be considered in the development of a bibliographic control system is the commercial concerns functioning to provide library services. These organizations are affected by decisions on how libraries shall operate and they influence our decisions. Examine the potential power and value of an operation such as the Xerox Bibliographic

Products division in association with the others in the Xerox "family." Bowker produces considerable data essential to the operation of libraries by compiling lists--Books in Print and now the publication of the NICEM indicies--and providing information on current production activity in the information field (print now and nonprint in the immediate future). We find Professional Library Service (PLS) operating alongside of Bowker and Library Journal Cards. Combine their functions, let PLS operate as its name implies by providing professional library service in the form of contracted staff for special functions, materials selection, consultants, etc. Add to this the capabilities of Xerox Data Systems and University Microfilms. If we need to retrain staff or provide new skills Xerox has a behavioral research division that can provide programs to do the training. After it is all said and done we can acquire hardware from Xerox to convert stored data into hard copy, duplicate copy, or transmit printed words by facsimile over distances both short and long. Commercial concerns do have a stake in our use of nonprint information.

Bibliographic control--the first gate through which we need to pass if we are to have interlibrary communication about and increased use of nonprint informational units can be open. Libraries with new technologies can become the mechanisms for identifying what information the patron wants (needs), producing the information in usable form from storage, and providing the patron with freedom of interaction with information.[6]

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[6]Nelson N. Foote, "The New Media and Our Total Society," in The New Media and Education: Their Impact on Society, ed. by Peter H. Rossi and Bruce J. Biddle, Anchor Books, Copyright 1966 by National Opinion Research Center (Garden City, N.Y.: Doubleday and Co., Inc., 1967), p. 400.

Personnel with a wide variety of tasks and responsibilities operate our libraries. One of the obstacles to program change is personnel. They may be an obstacle in the implementation of interlibrary communication of information networking programs. A problem to be overcome as a total merging of information in our libraries takes place is the print orientation (rather than information orientation) of most practicing librarians. Librarians working with all media are involved in the process of extending the senses of man, his perceptions, and his total sensorium.[7] Library personnel serve a mediator role between information and user. The librarian in a procognitive library becomes a translator between the patrons' perception of his need for information, the identification of the true need, accessing of the information, and then provision of the information in a manner most relevant to meet the specific needs of that specific patron. As a translator the librarian is more than the manager of the information store--he is involved in the use of information.

As Fig. 1 implies, the librarian is between the universe of stored information and the application of that information by patrons. The librarian-translator is a feedback link between the user of information and the creator of information or the information store. Translators in our information centers will need to know much about the patron to help identify how he uses information in his cognitive processes, abilities of the patron to

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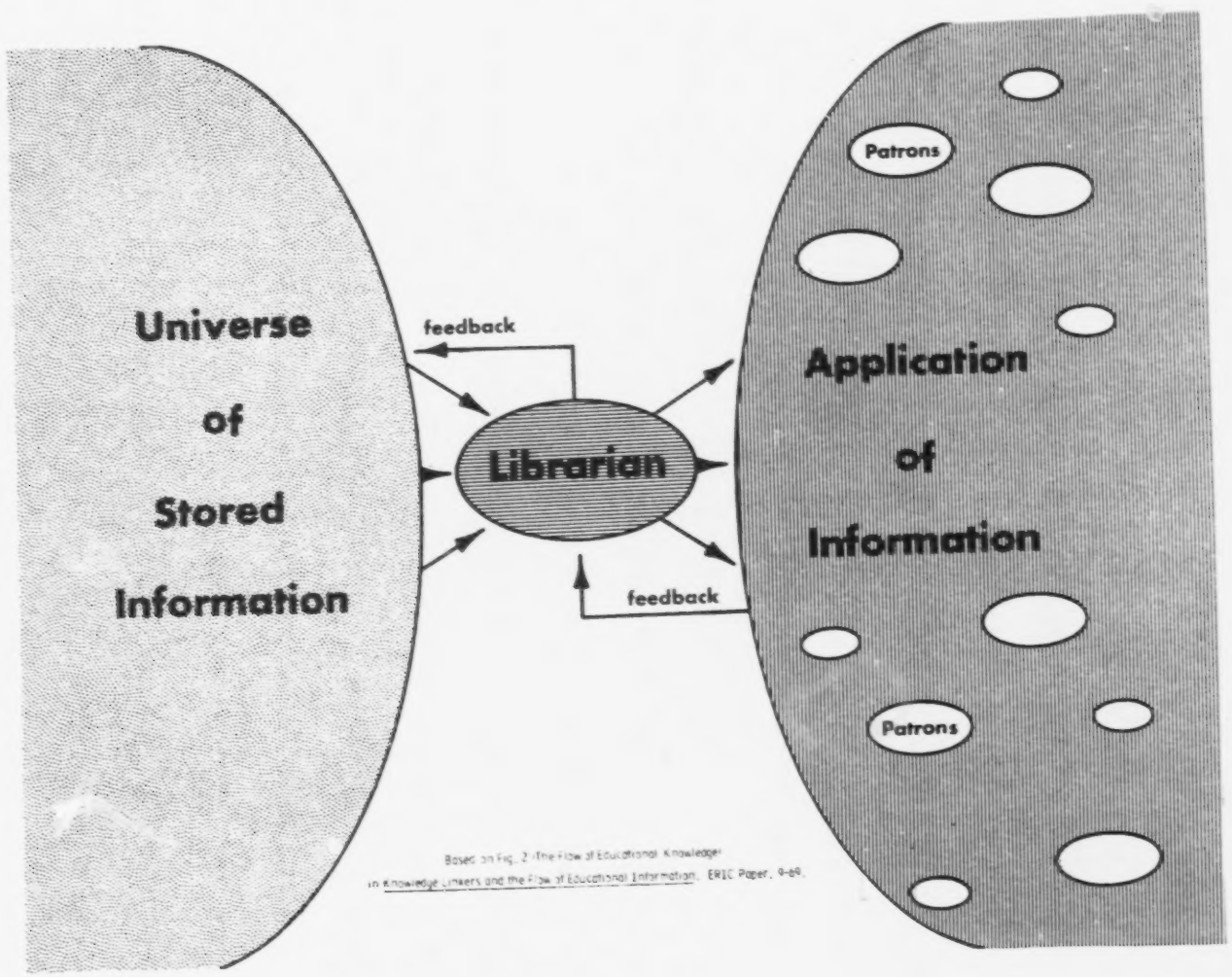
[7]Hayden R. Smith, "Media Men Arise: What if McLuhan is Right?" Educational Screen and Audiovisual Guide, 47 (June, 1968), 19.



Based on Fig. 2 "The Flow of Educational Knowledge"
in Knowledge Linkers and the Flow of Educational Information. ERIC Paper, 9-69.

communicate an informational need, how to access information, and how to store new information for future access.

Audiovisual specialists have been permeating the information field for many years and finally the audiovisual specialist--who was only recently referred to as a gadgeteer--has almost become accepted as a professional peer with colleagues in the classroom.[8] Can we assume that he is being accepted by his library colleagues as a peer? Development of this peer relationship will be the responsibility of the audiovisual specialist. He must learn to apply the principles of library or information science to his operations with nonprint materials. He must make his skills available to librarians, helping them interact with informational stores and meet the needs of the patrons. He must become as competent as his library colleagues if he is to become a librarian.

We find, then, that the present operants in the library field may need retraining. Pre-service training for the translators now in translator school (library school) must be modified to help them grasp an understanding of their role in the movement and application of information. They must become familiar with nonprint resources and they need to know equipment operation so that they can display the nonprint materials. In this age of rapid technical change, as Husén and Boalt in their writings about educational change in Sweden indicate, we need to educate for an increased amount of technical know-how and, possibly more important,

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[8]James S. Martin, "The Audio-Visual Department Comes of Age," American School and University, 40 (February, 1968), 24.

for flexibility or ability to adapt to change.[9] We will experience a rapid increase in varieties of information storage systems and accessing techniques. The printed word has competition.

The end of the last decade saw man walk on the moon. Long before we had a record of this event in printed-word form we on Earth saw man step on the surface of the moon, the video tape recorders stored the sight and sound of this feat, computers and digital data records stored indication of the astronauts' heart rate, equipment read-outs, etc. The printed word lost the race to record history of man's first lunar step. As our informational glut, especially in the nonprint realm, increases we must learn to cope with it.

As we develop personnel to serve as translators between a patron's true need for information and the provision of that information, as we develop information and not thing-oriented librarians, and as we become familiar with the nonprint information storage systems we open the second gate between us on the path to information use, interlibrary communication and information exchange.

The administration of our information center program can be viewed as the enabling activities that allow the library system to exist and meet the informational needs of patrons. Little can be said about the special aspects of library administration that is not as applicable to print as well as nonprint. A thing orientation, not information orientation, in library administration

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[9]Torsten Husén and Gunnar Boalt, Educational Research and Educational Change: The Case of Sweden (New York: John Wiley and Sons, Inc., 1967), p. 31.

may complicate development of nonprint resource collections since most administrators of libraries, like the libraries themselves, are print- and thing-oriented. As this "thing" orientation is overcome the administration can see the library acquiring informational units and, therefore, provision of support for these units (be they print or nonprint) will follow. The administrative functions (providing personnel, budgeting, purchasing, patron services, interinstitutional cooperation, etc.) are much the same, but the mechanics of performing the functions will differ for print and nonprint.

The administrative gate between total information use and interlibrary communication is an easy one to open if administrators of information centers are sensitive to the needs of the patron group served and the developments within the information field.

Technological developments in the nonprint information field need not be new to have an impact on our information center programs. Within libraries the application of existing technologies represented by motion picture display, video or audio magnetic tape storage and display, photographic storage in color transparencies, closed-circuit television within a library to aid in communication, telephone for "long-distance" reference service, teletype for routine communication between information centers, or community antenna television systems for communication throughout a community have received less than desired attention.

Computers offer many potentials for library operation beyond management and bibliographic control. Computers can provide display of printed or graphic data. Libraries may even

provide patrons with access to a local or remote computer via terminals. Employing the CATV system, for example, the patron remote from the library might access stored information or interact with a computer stored learning program, or the patron might be switched by the local library's computer into an information network which then allows the inquiry to be met by the remote information store applicable. The extent that the computer will function within the information system will be limited by the defined function of that system.

Storage systems for nonprint materials may take on a variety of forms depending on use of the storage device. Nonprint resources do not lend themselves well to browsing on the shelf, therefore a closed-stack arrangement with high density storage may be used. Access may be on a remote electronic basis such as in dial-access information retrieval systems where the patron accesses stored video or audio materials using a switching matrix to address the stored item. Interlibrary networks might carry high traffic in video or audio materials via the electronic interlibrary connections.

Physical items in the nonprint realm are becoming smaller and simpler to store. Audio tape in cartridges or cassettes are less prone to damage by misuse and are more compact than either open reel-to-reel tape or audio discs. Motion picture film in 16mm is not difficult to store but an increasing number of 8mm films, smaller and less costly, are becoming available. In some cases 8mm film is stored in cartridges, further simplifying display and storage.

Display devices are increasing in dependability and becoming simpler to operate. Functions performed by the newly developed devices offer increased capabilities for interaction with stored information or people serving as resources. Telewriters may be interfaced with normal voice telephone lines allowing for the transmission of written documents to either a desk-top paper receiver of a receiver-projector allowing the remote image creator to draw an image for instant projection to a group of people. Coupled with interactive amplified telephone conversations information can be exchanged between groups or individuals.

Video-phone or two-way television allow for visual contact during communication but they further allow for the "live" examination of objects. In reference work the questioning-negotiation associated with reference analysis might be expedited if the reference specialist could see the patron and see the materials to which he makes reference--likewise the patron could see the reference person and examine items with potential for solving the informational need. This video communication channel would allow for data transmission or video display as well.

Portable audio playback devices such as cassette players are inexpensive and fairly servicable. They can be checked out along with the cassettes. Wireless headset units allow a patron in the library to listen to a recording being played while giving the patron freedom of movement throughout the library since he receives the program on a transmitted radio signal over his battery operated radio-headphones. Battery operated video tape recorders and players with monitors, 16mm sound filmstrips,

cartridge 8mm sound projectors, video disc players, EVR (electronic video recorder), and on ad infinitum could be shown to have implications for libraries.

With telephone service in our information centers the capability for total information exchange exists. Voice grade telephone circuits can carry teletype signals or the analog signals of the telewriter type devices. These existing circuits can become the distribution system for an audio information system. At Washington State University the decision was made in 1969 to develop a telephone based dial-access audio system. To avoid the capital investment of wiring the library or city of Pullman, where WSU is located, arrangements were made with General Telephone and Electronics of the Northwest for the installation of a switching matrix allowing an operator to interconnect an incoming telephone line (or combination of lines) with a variety of audio playback sources. Now any telephone anywhere on or off campus can dial the listening library and listen to audio material. The system does not have adequate fidelity for music but the solution to that problem will be explored in the discussion of CATV system applications. Washington State University pays a normal telephone charge for each phone line coming into the system--the telephone company maintains the system except for the program sources. Services, rates, disconnect orders, or repair are handled like normal telephone service.

Community antenna television systems provide coaxial cable interconnection between homes, schools, businesses, or libraries. The CATV systems are generally associated with the distribution

of off-the-air television. The system can function in a much broader application for many forms of video, audio, or data communication. As part of the WSU system the CATV system (commercially owned) is used to distribute video and/or audio programs from the University Library, on demand or by schedule. If large numbers of patrons need to access an audio program or if the fidelity must exceed the telephone's capabilities the program is carried via FM broadcast to the patron on the CATV system.

As CATV systems start interconnecting and as commercial carriers start interconnecting these CATV systems a network grid starts to develop.

VIDAC, a Westinghouse Learning Corporation development, holds interesting prospects for information storage and use. The VIDAC system is an integrated media system--print or still images, motion, sound--and it is compatible with present telephone or television technology. Information is stored on magnetic video tape in a compressed manner and then when accessed it is provided through a buffer which converts it from its digital storage medium to audiovisual material. The VIDAC system can store 75 color visuals on a few cents worth of magnetic tape. A 15-minute program can be sent to a remote buffer in 3 seconds and then the patron views the program in real time. The storage tapes can be duplicated. The buffer can be encoded to selectively receive and store only certain programs. For example, a mass of programs could be distributed over a broadcast TV station before start of the day's programming, and only those desired would be stored by the remote buffer storage system. The only major unique element in the VIDAC

system is the buffer. In volume production the buffer might sell for $300 to $400.

Instructional television fixed service and satellites have applications for the distribution of library information. The ITFS systems have the capabilities of interconnecting a group of information centers with medium proximity to one another for the interchange of a wide range of information. Hughes Aircraft has proposed a high power S band experiment for the ATS-G spacecraft. With this variety of satellite libraries could, over a continental region, share masses of recorded information. Technologically, the satellite could serve as a repeater between the earth station which receives the signal from the information library and then the receiving earth station distributes it to the requesting library which could then store the signal in a buffer device for the patron to access at a convenient time.

With satellites we shall pause. Communication technology, from the auto-thread 8mm sound projector to spacecraft, can carry any message we can design. We need to decide what messages are to be carried, whom they are to be carried for, and what information storage units we want to access.

There is one possible caution. Since people are attracted by hardware, often without rationality, because it has a special appeal or excitement--as new hardware becomes available there seem to be people that promote its use, promise potentials beyond reason, and apply it with only the weakest of rationales.[10]

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[10]Robert M. Gagne, "Educational Technology as Technique," Educational Technology, 8 (November 15, 1968), 11.

Another gate has been easily opened with the use of communication and materials display technology.

Legal and political aspects of information generation, storage and use is the last gate on the path to full employment of nonprint resources in library communication systems. Legal and political--start with copyright. What will come out of the present deliberations? Will libraries exist as we know them today under the new copyright law? Will we be able to transmit stored information from the storage device to the patron under the new law? No one knows at this time. This may be a most difficult gate to open especially when combined with the political-legal implications of funding the interlibrary communication and information network programs.

III. DEVELOPING IDEAS AND SYSTEMS

In Detroit during the 1970 Department of Audiovisual Instruction Convention the first and second divisions of that organization were formed (unlike the American Library Association, DAVI had never instituted special interest divisions). The first division was Telecommunications and the second was Media Organization and Control. The Media Organization and Control division should have a solidifying effect on the nonprint librarians within DAVI and there might be created a closer working relationship between sections within ALA divisions as problems of common interest are tackled.

At a Joint Council on Educational Telecommunications meeting in March, 1970, Clay Whitehead of the White House discussed the concern of the White House in telecommunications policy. Whitehead indicated that an office on telecommunications policy, with a staff of about 30, was to be established in the Executive Office of the President in April, 1970. This agency will be the key one in the executive branch of the government in the field of telecommunications. This agency might have involvement with interlibrary networking programs or development of carrier systems employable for library communication.

A further step was taken in April of this year to develop audiovisual equipment performance standards when the ALA Library Technology Program signed an agreement with DAVI to jointly

sponsor and finance the drafting of standards for record players, tape recorders and playback units, 16mm motion picture projectors, and filmstrip and combination filmstrip/slide projectors.

In Washington State two developments are worthy of mention. First, the Nonprint Resources Committee working with the State Library in activities planning for a State Library Network is identifying clusters of nonprint informational resources within the state. All sources, not just the formal libraries, are being identified and techniques studied on how to establish a type of union listing of these clusters. Ultimately, specific holdings will be listed and merged into the total informational resources for the State. Second, Washington State University is investigating with Microwave Transmission Corporation, General Telephone and Electronics of the Northwest, and talks have been held with other carriers, the possibility of a regional network for total communication. The prime function would be for people-communication via a two-way video system. The system would have additional capabilities for data transfer and a mini-library network has been proposed, as a demonstration project, if the WSU system becomes operational. This mini-network would involve, undoubtedly, considerable use of nonprint materials between the involved information centers.

Edgar Dale, at Ohio State University, one of the pillars in the audiovisual-information field, said that "The good society is above all else a learning society, a society that is growing, moving forward on a rising curve. . . . The good society encourages learning, does not prevent anyone from learning, provides access

to learning for all."[1] We librarians have a responsibility to provide society, our patrons, access to knowledge. We have an obligation to work with our patrons as they make use of information, regardless of the information's medium of storage.

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[1]Edgar Dale, "The Good Society," The Newsletter, 34 (May, 1969), 1.

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